
An Empirical Study of Association between Working Capital Management and Performance: Evidence from Tehran Stock Exchange

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Abstract: Present study is aimed at determining the effects of working capital management on the performance of firms. In this research, we have selected a sample of 112 Iranian firms listed on Tehran Stock Exchange for a period of 10 years from 2000–2009, we have studied the effect of different variables of working capital management including the Average collection period, Inventory turnover in days, Average payment period and Cash conversion cycle on the financial performance of Iranian firms. Debt ratio, Current ratio, size of the firm (measured in terms of natural logarithm of sales), financial assets to total assets ratio and Stock Exchange Index have been used as control variables, Correlation, and regression analysis (Pooled least square and general least square with cross section weight models) are used for analysis. The results show that there is a strong negative relationship between variables of the working capital management and profitability of the firm.

Key Word: *Working Capital Management, performance and liquidity*

1. Introduction

Working capital management is known as one of the main performances of a firm's financial management. In general, working capital management includes different kinds of current assets and short run financial resources, furthermore, working capital management, includes decisions related to basic long run finance for financial support of current assets of a profit organization. Reza & Heidarian, (2010) With respect to definition of working capital management, which is preparation of basic policies for working capital and performing it in daily operation of institute. Ahmadpour & Yahyazadeh (2008) About this subject, according to agency theory, manager is a person who should define optimum level of a working capital in a company, to be able both prepare financial budget of company and prevent wasting resources and wastage of shareholders rights because cash assets like other assets should be financed, then, we should imagine the cost of cash holdings as a difference between profit relieved from cash investment and cost of cash financing. Assessing performances in which includes using tools analyzing techniques about financial balanced sheets and other data, for earning information can be useful that achieved information in evaluation of past performances and today's firms' financial condition can be used. Gujarati, (2007) The purpose of this study was to determine the effects of four variables consisting working capital management, including the payment period, claims collection period, inventory turnover period and cash conversion cycle on the financial performance of listed companies on the Tehran stock exchange, discussion and presentation, Conclusions and recommendations, and also a few cases regarding the continued and followed up in future studies.

2. Literature Review

Payment Period: One of the components of working capital management is the payment period, delayed payments to suppliers of goods and materials that allow the company to be considered that purchasing their product quality and the selection of a financing source for cheap and flexible matter. On the other hand, the delay in payment of bills paid earlier if the discount is as CS may be binding for the cost. Deloof (2003) generally, the payment period is a time that it takes to settle accounts payments to express. Payment period for two purposes are used. Planning and preparing a budget, cash payments and other deadlines to compare it with the sellers of raw materials and goods to get their demands, which are set.

Collection period demands: The main goal of company executives to increase their company is worth, in relation to accounts receivable management can be effective in achieving this. Many of the current asset management models in the literature is included financial management, is based on the assumptions that the main goal of increasing profits office is funded (Michasiki, 2006), which increased profits in this model, office should be associated with other goals (such as increasing corporate value) strategies to increase corporate value always associated with risk and uncertainty, the increase in accounts receivable resulted Company working capital, increased maintenance costs and management of accounts receivable. This cost reduces the value of the company. However, a correct policy in accounts receivable management can increase corporate value (Michasiki, 2006).

Inventory turnover period: With the emergence of new systems, such as inventory systems and ..., emerged a new attitude towards inventory. A problem of financing and working capital considerations has led companies through appropriate controls imposed new insight into their own inventories. Financial reports, statistical analysis clearly suggests that an optimal level of inventories and apply the appropriate controls over inventories by reducing the cost of investment in inventories and inventories also reducing maintenance costs is possible, so supply and timely delivery of goods customers and also reduce maintenance costs and investment is one of the important challenges that managers through appropriate measures can be elevated (Kumarduta, 2007).

Cash conversion cycle: Another criterion to evaluate working capital cash conversion cycle is, the cash conversion cycle time required between purchases of raw materials and collecting funds from selling products made refers. What is the long term, the more investment in working capital is required. Cash conversion cycle longer than the hand may increase the profitability of the company through sales boost, however, if the cost investment in working capital is more than it benefits or granting excessive credit done business Profit Company may be reduced (Deloof, 2003).

Experimental research background: Rahman And Naser examined in his study the relationship between working capital management and profitability of the companies. In this study, 94 companies between 1999 and 2004 were examined and variables such as, cash conversion cycle, inventories turnover period, payment period, collection period demands, the current ratio, net operating earnings, firm size, debt ratio and the ratio financial assets had been used. Findings based on Pearson correlation, and regression analysis were obtained suggests that this was between the cash conversion cycle and its components including inventories turnover period, payment period and collection period are demands, relationship with corporate profitability There is a significant reverse. Research results also showed that between cash and debt, the company with profitability significantly a negative relationship exists between the addition size of the company and its profitability is a significant direct relationship. Abdul & Mohamed, (2007) in another study by Trifondis and Lazaridis, in line with research in Greece was Mark Dulf. In this study, 31 companies between 2001 and 2004 were examined and the results indicate that this was a significant inverse relationship between the cash conversion cycle and corporate profitability and managers can maintain a desirable level of cash conversion cycle demands of its components, including collection period, inventory turnover period and the payment period to increase company profitability. Lazaridis & Trifondis, (2006) Mark Laplant examined the impact on your research Working capital management on the value of the company. In this study, using questionnaires on efficiency of the factors working capital management in 150 companies between 1990 and 2004 samples were studied. The results were that the procedures, size and future sales growth on efficiency of the company could be effective working capital management. According to the study, Mark Bryan is believed that excessive investment in working capital can reduce corporate value (Laplant, 2005).

Troll Garcia and colleagues analyzed data on a sample of small and medium-sized Spanish companies during the period 1996 to 2002 found that reducing the collection period claims managers and inventory maintenance period and reducing the overall cash conversion cycle period, can profit companies under its management to improve shareholder value for their playing. Garcia-Terual & Solano, (2007) Soenen in their investigation acknowledged that management is trying to cash conversion cycle demands as soon as possible to collect and pay the debt as possible to delay and thus the cash conversion cycle is shorter. Soenen, (1993) Abdel-Nejad correlations between the type of race strategy with working capital efficiency and risk stock companies in Tehran Stock Exchange on several industry and examined the relationship between these

variables was not significant. Abdel-Nejad (2007) and Torghe (2008) examines the relationship between working capital management and asset efficiency of small and medium companies in Tehran Stock Exchange and received payment demands collection period, inventory turnover period and cash conversion period with corporate profits are inversely related to the payment period debt has a direct relationship with profitability. Torghe, (2008) Reza Zadeh, also research Heydarian working capital management effect on the profitability of Iranian companies in the years 1998 to 2007 to pay the research results showed that among the demands of collection period, period inventory maintenance and debt payment period with profit companies Iranians that there is significant negative relationship. Reza & Heidarian, (2010) Lashgari research to evaluate the effect of working capital management factors on corporate profits paid, results suggest that there has been a significant negative correlation between the components of working capital management and corporate profitability. Lashgari, (2010) According to the discussions said above research hypothesis can be stated as follows:

Research hypotheses: Main theory research: The relationship between Working Capital Management of Company and the financial performance is significant.

Research sub-assumptions:

- There is a significant relationship between the demands of the average collection period and corporate financial performance.
- There are significant relationships between the inventory cycle and financial performance of companies.
- Significant relationship exists between the average payment periods and financial performance of companies.
- Significant relationship exists between the cash conversion period and financial performance of companies.

3. Methodology

The purpose of this research, applied research and in terms of nature, is descriptive research. Following the explanation of the relationships between several variables is estimated on working capital management with financial performance using multiple regressions. In this study to test the hypothesis, I have been used combined cross-sectional regression

Population statistics and sample: Ten years of the study period, from 2000 to 2009 and population. The study comprised of all companies listed securities in Tehran. Companies discussed in terms increased comparability, should lead to the end of their fiscal period March and due to the specific nature of the activity, the industry they are not banks and financial institutions. Moreover, the efficiency of the financial year when the changes are not needed and all information is available. According to the criteria listed, the number of 112 companies selected for this research.

Research Variables: Due to reasons discussed in the Theoretical Foundations, in this review, the average collection period demands, inventory turnover period, the average payment period and cash conversion period, working capital management representatives as independent variables of the research and return of equity (ROE) to measure corporate financial performance as dependent variables are introduced. Also according to the principles stated and the research, background variables firm size, debt ratio, the ratio of financial assets to total assets as control variables have been used in the study.

Equity returns: To calculate this variable from the following equation can be used.

$$, ROE = (\text{Net profit}) / (\text{equity})$$

The average collection period demands: this variable as a representative for the study of politics demands the company is receiving, through the medium into account in finding the sales revenue and multiplying the result on the 365 obtained.

$$ACP = (\text{average accounts receivable of} \times 365) / (\text{sales revenue})$$

Inventory turnover period: this variable as a representative to express policies is inventory, the division of this variable on the average inventory cost of goods sold and multiplying the result on the 365 (number of days of the year, sometimes 360 in is taken) is obtained in calculating the average collection period demands of sales revenue is used in the calculation, while inventory turnover period of the cost of goods sold is used to increase the accuracy of this calculation is because , inventory cost of material goods, while the demands made of sale.

$$ITID = (\text{average inventory of goods} \times 365) / (\text{cost of goods sold})$$

The average payment period: the variable pay policy in order to express the company has been studied. This variable divided by average accounts payable on the purchase of goods and multiplying the result on the 365 is obtained.

$$APP = (\text{average accounts payable} \times 365) / \text{purchase}$$

Cash conversion period: the variable value that is complete and comprehensive assessment can be considered working capital management (Abdul & Mohamed, 2007), because this variable demands total average collection period, inventory turnover period and average payment period (With regard to the payment period is a negative number) is gained.

$$CCC = \text{« inventory turnover period+ claims receipt period»} - \text{Deposit term creditors}$$

Control variables in this research study all variables that are used in many research and Gentlemen is Mark Dulf, and Naser Rahman and Shane Soenen and working capital management are studied in their investigation of variables as control variables.

$$\text{Current ratio: } CR = (\text{current assets}) / (\text{current liabilities})$$

$$\text{Debt ratio: } DR = (\text{total debt}) / (\text{total assets})$$

$$\text{Natural logarithm of sales: } LOS = \ln (\text{sale})$$

$$\text{Financial assets to total assets: } FATA = (\text{financial assets}) / (\text{total assets})$$

So said the cases above regression model can be stated as follows research.

$$ROE_{it} = \beta_0 + \beta_1(ACP_{it}) + \beta_2(ITID_{it}) + \beta_3(APP_{it}) + \beta_4(CCC_{it}) + \beta_5(CR_{it}) + \beta_6(DR_{it}) + \beta_7(LOS_{it}) + \beta_8(FATA_{it}) + \varepsilon$$

4. Results

Given that the study about 112 companies listed in Tehran Stock Exchange has been collected and extracted data included study of ten variables that aim to investigate the effect of independent variables on the dependent variable, so the most appropriate method of regression analysis research is to test hypotheses. To perform linear regression, there are assumptions. Minimum scale interval of measurement, normal distribution of variables, a linear relationship between dependent and independent variables, equal distribution of the remaining, the same variance of variables, their lack of correlation and linear relationship was because of Assumptions regression analysis. In the present study measured variables proportion scale, the relationship between dependent and independent variables is linear. To evaluate the linear relationship between dependent and independent variables of the overall regression coefficient test was used. Finally, to evaluate the independent variable on the dependent variables from the regression analysis is used.

Reviews Dissonance Variance: There dissonance sentences for disturbing variance Arch LM test and White test was conducted. Arch LM test results dissonance variance table is as follows:

Table 1: Test results dissonance Arch LM

description	statistic	prob
F-statistic	395.7459	0.000000
Obs*R-squared	292.7389	0.000000

Also, the results of performance tests that dissonance White variance table is as follows:

Table 2: Test results dissonance White

description	statistic	prob
F-statistic	2.171661	0.004757
Obs*R-squared	34.20460	0.005098

Considering that both of these test statistics is significant at 5 percent, so the homology of variance is rejected and disturbing dissonance variance sentences are accepted. This is caused by the breach is $Var(U_i) = \delta^2 I$

Such problems will cause regression in the OLS results are not more efficient. For the aforementioned problem of generalized method of least square (GLS) is used.

Check your Correlation: In order to test their lack of correlation in statistics Camera Model - Watson used. The statistics based on the findings of the table is 2.099 times the number three. If these statistics in the range 1.5 to 2.5 would be the test H0 lack of correlation between residues are accepted and otherwise rejected H0 can be accepted that the correlation between the existence there. According to statistics obtained can be admitted that this model there is no correlation between positive and negative.

So in general can be stated that for the regression model to investigate generalized method of least square (GLS) is used.

Testing Hypotheses: Test assumptions about the existence of a significant relationship between working capital management with the financial performance of companies listed in Tehran Stock Exchange. To estimate the model based on the research method described combination of regression fixed effects methods are used. Significant test coefficients for independent variables t-statistics and for tests of significant coefficients at the same time all the variables in explaining the dependent variable we use the F statistic. According to the results of the test model to describe the table number three can be seen that the amount of statistics related to the P-Value F (prob (F-statistic)), indicating that significant regression of the total is equal to 0/000 and model indicated that 99 percent confidence level is significant. Coefficient of determination Adjusted R² to 0/492 and this indicates that approximately 49% of variability can be explained with the variables of the model is.

Table 3: Results of regression combination

independent variables: ROE				
$HP_{it} = \beta_0 + \beta_1 Spread_{it} + \beta_2 Volatility_{it} + \beta_3 B/M_{it} + \beta_4 CF_{it} + \beta_5 MKT_{it} + \beta_6 Size_{it} + \beta_7 INST_{it} + \beta_8 LEV_{it} + \beta_9 ROA_{it} + \varepsilon_{it}$				
Variable	Coefficient	Prob.	t-Statistic	
ACP	-0.008033	0.0000*	-31.04088	
ITID	-0.006719	0.0000*	-26.18697	
APP	-0.006833	0.0000*	-26.65840	
CCC	-0.006822	0.0000*	-24.97212	
CR	0.236630	0.0000*	13.02845	
DR	0.926648	0.0000*	8.835815	
LOS	-0.055939	0.0000*	-16.36588	
FATA	-0.086173	0.0155**	-2.423088	
F-statistic	172/310	Durbin-Watson	2/099	
		stat		
Prob(F-statistic)	0/0000	Adjusted R-squared	49%	

*Significant at the 0.01 level with one-tailed test

**Significant at the 0.05 level with one-tailed test

That: ACP: average collection period demands, ITID: inventory turnover period, APP: The average payment period, CCC: cash conversion periods, CR: Current Ratio, DR: debt ratio, LOS: natural logarithm of sales, FATA: financial assets to total assets

Test the first hypothesis: As you come back from the table number three variable factor demands, average collection period (ACP) in accordance with previous expectations and negative -0/00803 are equal. According to the statistics T and p-Value for this variable, the results indicate a significant error in the coefficient is 1 percent. These findings show that the ratio of total average collection period with the profit demands of companies having the relationship is negative and significant.

The second hypothesis test: Inventory turnover period (ITID) also in accordance with previous expectations and negative equal - 0/00671 is calculated, according to statistics p-Value T and the variable can be concluded that the 1 percent error level coefficient significant be. These results confirm that this is the inventory turnover ratio of total period profit companies have with the relationship is negative and significant.

The third hypothesis tests: The average payment period (APP) also in accordance with previous expectations and negative equal - 0/00683 is calculated, according to statistics p-Value T and the variable can be concluded that one percent error level coefficient is statistically significant. These results confirm that this ratio between the average payment periods, with total profit companies having the relationship is negative and significant.

Fourth hypothesis test: Cash conversion period (CCC) in accordance with the negative and equal to the previous expectations - 0/00682 is calculated, according to the statistics T and p-Value of this variable can be concluded that the coefficient of error of 1 percent significance level is. These results confirm that this is the total coefficient between the cash conversion period profit companies have with the relationship is negative and significant. The test was conducted on the above control variables: current ratio (CR), debt ratio (DR), natural logarithm of sales (LOS) and the ratio of financial assets to total assets (FATA) Because Prob obtained for less than is 0.05, so that can be expressed with the four factors in the financial performance of companies listed in Tehran Stock Exchange are meaningful relationship. So that the current ratio (CR) and debt ratio (DR) positive correlation of natural logarithm of sales (LOS) and the ratio of financial assets to total assets (FATA) have a significant negative relationship. According to the cases stated above tests can be performed by the final regression was expressed as follows:

$$ROE_{it} = -0.008(ACP_{it}) - 0.006(ITID_{it}) - 0.006(APP_{it}) - 0.006(CCC_{it}) + 0.236(CR_{it}) + 0.926(DR_{it}) - 0.055(LOS_{it}) - 0.086(FATA_{it}) + \varepsilon$$

5. Conclusion

This study, relationship between working capital management and performance in companies admitted in Tehran Stock Exchange has been. In this regard, the first measure factors working capital management and financial performance of companies listed with the Tehran Stock exchange with use of efficiency ratio of equity to the effect of these factors has been discussed. Because of four tests conducted hypothesis we have achieved the following results. Is the first test, the relationship between collection period with the demands of corporate profit results indicate a significant negative relationship between these two variables is that the results of this research has shown that reducing the collection period demands a reasonable level in companies and proper use of credit policies, only one of the ways that corporate managers can thereby increase their company performance. The second hypothesis test, namely the relationship between inventories and cycle financial performance of companies, the results indicate a significant negative relationship between these two variables is that the results of this research has shown that reducing cycle inventories at reasonable levels in optimal level of inventories held companies, only one of the ways that corporate managers can thereby increase the profitability of their company. The third is about the test, the relationship between pay periods and corporate financial performance results indicate a significant negative relationship between these two variables has been indicated that this reduction in the pay period in the company and pay a reasonable limit to bills on time, only one of the ways that corporate managers can thereby increase their company performance. Is the fourth test, the relationship between the cash conversion cycle and corporate financial performance results indicate a significant negative relationship between these two variables has been indicated that this reduction in the cash conversion cycle at a reasonable level of profitability is considerable impact on company. Since the average collection period demands, inventory turnover period and average payment period, cash conversion cycle elements are considered, so if that

company executives want the cash conversion cycle in their company to reach optimum level (optimum level to lower), should accounts receivable, inventories and payments of their company to manage the correct way. A general criterion for inventories and working capital management courses creditors is deposited. In other words, if the company executives want the cash conversion cycle in the optimal level of their company should bring down accounts receivable, inventories and payments of their company to manage the correct way. So can be said that quad independent research variables, a total explanation acceptable and significant effects on the dependent variable and thus have the research, study results with results expressed in a background investigation (Abdul & Mohamed, 2007; Lazaridis & Trifondis, 2006; Laplant, 2005; Garcia-Terual & Solano, 2007; Soenen, 1993; Reza & Heidarian, 2010; Lashgari, 2010) are consistent. The researchers also emphasized these factors, working capital management there is significant negative relationship between corporate performance and profitability that results in the study will confirm this. According to the results thus present working capital management has a great impact on corporate profitability, so company executives can reduce the collection period claims, creditors deposit period, cycle inventories and cash conversion cycle in a reasonable level of their company to increase profitability.

Suggestions regarding future research: To researchers who are interested in this research to suggest that in your research to consider the following:

- Considering the entire study in the recommended companies in various industries to perform the study reach. Because the type of industry to the researcher may be influential on the research results.
- If the availability of necessary information about production companies active outside the Tehran Stock Exchange on the investigation of these companies will also do.

References

- Abdel-Nejad, A. (2007). Strategy correlations between working capital with equity returns and risk, M.Sc. Thesis, Tehran University
- Abdul, R. & Mohamed, N. (2007). Working Capital Management and profitability – Case of Pakistani Firms. *International Review of business research papers*, 3(1), 279-300.
- Ahmadpour, A. & Yahya Zadeh, F. M. (2008). Financial Management, Vol1, fourth edition, Mazandaran University Press.
- Azr, A. & Momeni, M. (2002). Statistics and its application in management, 2, publisher side, Tehran
- Deloof, M. (2003). Does Working Capital Management Affects Profitability of Belgian Firms? *Journal of Business Finance & Accounting*, 30(3 & 4), 573-587.
- Garcia-Terual, P. J. & Solano, P. M. (2007). Effects of Working Capital Management on SME Profitability. *International Journal of Managerial Finance*, 3(2), 164-177.
- Gujarati, D. (2007). Principles of econometrics, Vol1, Institute of Tehran University Publications and Printing, Sixth Edition, Tehran
- Kumarduta, S. (2007). Management Working Capital: A Neglected Subject. *Management Decision*, 25(1).
- Laplant, M. (2005). Corporate Working Capital Management: Determinants and Consequences. *The ICFAI Journal of Management Research*, 6(5), 20-33.
- Lashgari, M. (2010). Effect of Working Capital Management on corporate profitability, M.Sc. Thesis, University of Mazandaran
- Lazaridis, I. & Trifondis, D. (2006). Relationship between Working capital Management and Profitability of Listed Companies in the Athens Stock Exchange. *Journal of Financial Management and Analysis*, 19(1).
- Michasiki, G. (2006). An Empirical Investigation of Factors Affecting the Cash Conversion Cycle, Annual Meeting of the Financial Management Association, Las Vegas Nevada.
- Reza-Zadeh, J. & Heidarian, J. (2010). Effect of working capital management on profitability Iranian companies. *Journal of Accounting and Auditing Research*, 7, 20-33.
- Shbahang, R. (2004). Financial Management. *Publications Auditing Organization*, 7(1).
- Soenen, L. (1993). Cash Conversion cycle and corporate profitability. *Journal of Cash Management*, 13(4), 53-57.
- Torghe, S. (2008). Effects of working capital management on small and medium enterprises Iran, M.Sc. Thesis, Al-Zahra University.